

REMARKS

Entry of the foregoing, re-examination and reconsideration of the subject matter identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.112, and in light of the remarks which follow, are respectfully requested.

Claims 1 and 3 have been amended in response to issues raised in the Office Action. Claim 9 has been canceled without prejudice or disclaimer. Claims 1-8 and 10-17 are currently pending in this application. Claims 10-17 stand withdrawn from consideration on the merits.

Claims 1-9 were rejected under 35 U.S.C. §112, second paragraph, for the reasons set forth on page 3 of the Office Action. Reconsideration of this rejection is requested in view of the above amendments and the following remarks.

The word "kind" has been deleted from claim 1. Claim 3 has been currently amended to replace "derivatives" with α -methylstyrene and vinyltoluene, the styrene derivatives disclosed in the specification on page 13, lines 10-11. Accordingly, the §112 rejection has been obviated and should be withdrawn.

Claim 9 was rejected under 35 U.S.C. §102(b) as anticipated by or, alternatively, under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 4,613,649 to Saeki et al., U.S. Patent No. 4,802,984 to Waite or U.S. Patent No. 5,312,847 to de Vos. The Examiner's rationale is set forth on pages 3-4 of the Office Action.

While not admitting the propriety of this rejection and solely to expedite prosecution of the present application, claim 9 has been canceled without prejudice or disclaimer. Accordingly, the rejection of claim 9 has been obviated.

Claims 1 and 6-9 were rejected under 35 U.S.C. §102(b) as anticipated by or, alternatively, under 35 U.S.C. §103(a) as obvious over Feng et al. (Characterization of styrene polymerization in microemulsions by Raman Spectroscopy, Colloids and Surfaces, 53 (1991) 349-361) for the reasons given on page 4 of the Office Action. Reconsideration and withdrawal of these rejections are requested for at least the following reasons.

The present claims are directed to an emulsion polymerization process where continuous monitoring of the polymerization is conducted by Raman spectroscopy, the process data calculated from the results of the spectroscopy then compared with reference data specific to the production of a desired latex, and reaction parameters adjusted to minimize differences between the measured data and the reference data. As specified in the claims, monitoring of both the monomer concentration and the polymer concentration are conducted.

The article by Feng et al. discloses a process whereby Raman spectroscopy is used to determine breaking of the C=C bond and formation of C—C bonds. On page 353, the authors state: “ . . . the absolute peak area of the carbon-carbon double bond can be used directly to calculate the conversion of monomer.” Fig. 2 shows that only monomer concentration is determined. Feng et al. do not teach or suggest that the monomer data should be used to adjust process parameters.

Since Feng et al. does not disclose using Raman spectroscopy data to measure monomer and polymer concentrations nor the step of adjusting reaction parameters, it is submitted that the article does not constitute an anticipation of claims 1 and 6-8. Nor does the Feng et al. article fairly suggest the steps of

determining monomer and polymer concentrations and adjusting reaction parameters. Accordingly, the §§102(b) and 103(a) rejections should be withdrawn.

Claims 1-3 and 6-9 were rejected under 35 U.S.C. §103(a) as obvious over Feng et al (Characterization of styrene polymerization in microemulsions by Raman Spectroscopy, Colloids and Surfaces, 53 (1991) 349-361), in view of Adar et al. (Raman Spectroscopy for Process/Quality Control, Applied Spectroscopy Reviews, 1997, pp. 45-1-1, vol. 32) or Claybourn et al. (Analysis of Process in Latex Systems by FT Raman Spectroscopy, Journal of Raman Spectroscopy, 1994, pp. 123-129, vol. 25), for the reasons given on pages 4-5 of the Office Action. Reconsideration and withdrawal of this rejection are respectfully requested for at least the following reasons.

The deficiencies in the disclosure of Feng et al. were discussed previously. Like Feng et al., the process disclosed by Adar et al. only monitors the disappearance of C=C bonds during polymerization. There is no disclosure or suggestion in Adar et al. of measuring both monomer and polymer concentrations and using this data to adjust reaction parameters. Claybourn et al. is only relied upon for the disclosure of FT or optical dispersive Raman. The combined disclosures of all three documents fails to disclose or suggest the presently claimed process whereby concentration of both monomer and polymer are determined and the reaction parameters adjusted thereby.

The importance of determining the concentration of both monomer and polymer is proven by the results obtained in Examiner 3 (page 30, lines 2-11) when only monomer concentration was monitored, Example 4 (page 32, lines 9-12) when

only polymer concentration was monitored and Examples 5-6 where both monomer and polymer concentrations were monitored.

The cited art does not provide a teaching which would motivate those of ordinary skill to develop a process as that claimed herein. Accordingly, the §103(a) rejection over Feng et al. in view of Adar et al. or Claybourn et al. should be reconsidered and withdrawn. Such action is earnestly requested.

Claims 1-9 were rejected under 35 U.S.C. §103(a) as obvious over Feng et al. (Characterization of styrene polymerization in microemulsions by Raman Spectroscopy, Colloids and Surfaces, 53 (1991) 349-361), in view of Adar et al. (Raman Spectroscopy for Process/Quality Control, Applied Spectroscopy Reviews, 1997, pp. 45-1-1, vol. 32) or Claybourn et al. (Analysis of Process in Latex Systems by FT Raman Spectroscopy, Journal of Raman Spectroscopy, 1994, pp. 123-129, vol. 25), and further in view of Saeki et al. (U.S. 4,613,649), Waite (U.S. 4,802,984) or de Vos (U.S. 5,312,847) for the reasons provided on pages 5-6 of the Office Action. Reconsideration and withdrawal of this rejection are requested for at least the following reasons.

The deficiencies in the basic combination of Feng et al. in view of Adar et al. or Claybourn et al. were discussed previously. The combined teachings of these three documents fails to disclose or suggest a process whereby monomer and polymer concentrations during emulsion polymerization are monitored via analysis of Raman spectroscopic data, the data compared with reference process data, and the process parameters modified accordingly. The patents to Saeki et al., Waite and de Vos are relied upon solely for their disclosure of preparing butadiene/styrene

copolymer lattices. As such, the tertiary references fail to supply the deficiencies in the basic combination of Feng et al., Adar et al. and Claybourn et al.

For at least the above reasons, the §103(a) rejection over Feng et al. in view of Adar et al. or Claybourn et al. and further in view of Saeki et al. '649, Waite '984 or de Vos '847 should be withdrawn. Such action is respectfully requested.

Claims 1-3 and 6-9 were rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Adar et al. (Raman Spectroscopy for Process/Quality Control, Applied Spectroscopy Reviews, 1997, pp. 45-1-1, vol. 32) for reasons set forth on page 6 of the Office Action. Reconsideration and withdrawal of these rejections are respectfully requested for at least the reasons which follow.

As discussed above, the article by Adar et al. only monitors disappearance of the C=C bond. Thus, only monomer concentration is monitored. The reference clearly does not monitor monomer and polymer concentration. Further, Adar et al. does not positively disclose the claimed step of adjusting reaction parameters. For these reasons alone, Adar et al. does not constitute an anticipation of claims 1-3 and 6-9.

Furthermore, Adar et al. contains no teaching or suggestion which would provide a motivation to those of ordinary skill to use Raman spectroscopy data to monitor both monomer and polymer concentrations during polymerization and use the data to adjust reaction parameters. Thus, the reference fails to render the claims *prima facie* obvious.

For at least these reasons, the §102(b) and §103(a) rejections over Adar et al. should be withdrawn. Such action is earnestly requested.

Claims 1-9 were rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Adar et al. (Raman Spectroscopy for Process/Quality Control, Applied Spectroscopy Reviews, 1997, pp. 45-1-1, vol. 32) and Nielsen et al. (U.S. 6,175,409) and further in view of Saeki et al. (U.S. 4,613,649), Waite (U.S. 4,802,984) or de Vos (U.S. 5,312,847) for the reasons given on pages 6-7 of the Office Action. Reconsideration and withdrawal of these rejections are requested for at least the following reasons.

The use of five documents in support of an anticipation rejection is clearly improper. For an anticipation, only one reference must disclose each and every claimed feature. Accordingly, the §102(b) rejection should be withdrawn.

The references to Saeki et al., Waite and de Vos are relied upon solely for their teachings of the emulsion polymerization of butadiene and styrene. As such, they fail to supply the deficiencies in the disclosure of Adar et al. as enumerated above. Nielsen et al. '409 is relied upon in the rejection solely for the disclosure of libraries of polymerized mixtures. The combination of all five documents does not render obvious the presently claimed process.

For at least the above reasons, the rejection over Adar et al. and Nielsen '409 in view of Saeki et al., Waite or de Vos should be withdrawn. Such action is earnestly requested.

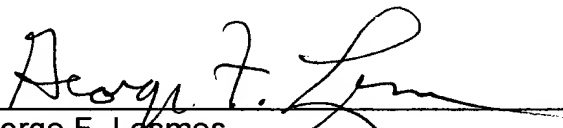
From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is respectfully solicited. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned at (703) 838-6683 at his earliest convenience.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

Date: March 30, 2004

By:

A handwritten signature in dark ink, appearing to read "George F. Lesmes", is written over a horizontal line.

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